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In the Claims

1. - 9. (cancelled)

10. (Currently Amended) An imaging system for imaging structures of tissue, comprising:

a detector array;

an acoustic receiver coupled to said detector array for receiving acoustic signals generated in response to radiant energy delivered to said tissue and detected by said detector array;

an image reconstructor coupled to said acoustic receiver for performing a backprojection algorithm to generate a representation of acoustic signals generated at points within the tissue, the representation for a point being based upon signals from plural detectors in said detector array;

an ultrasound receiver coupled to said detector array for receiving echoes from an ultrasonic beam delivered into said tissue; and

an ultrasound beam steering circuit coupled to said detector array for causing said array to generate said ultrasonic beam.

11. (Currently amended) The imaging system of claim 10 further comprising a TACT processing system incorporating said image reconstructor for producing TACT images using acoustic signals detected by the said detector array, said TACT receiver coupled to said TACT processing system.

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12. (previously presented) The imaging system of claim 10 further comprising an ultrasound imaging system, said ultrasound receiver coupled to said ultrasound imaging system.

13. (previously presented) The imaging system of claim 10 wherein said ultrasound beam steering circuit is coupled to and controlled by an ultrasound imaging system.

14. (previously presented) The imaging system of claim 11, wherein said TACT processing system sends images to a display.

15. (previously presented) The imaging system of claim 12, where in said ultrasound imaging system sends images to a display.

16. (Currently amended) A method for using an imaging system for imaging structures of tissue, comprising:

coupling a transducer array to said tissue;

receiving, with said transducer array, thermoacoustically acoustic signals

originated within said tissue in response to radiant energy delivered to said tissue;

performing a backprojection algorithm to generate a representation of acoustic signals generated at points within the tissue, the representation for a point being generated from signals from plural transducers in said transducer array;

delivering ~~[[an]]~~ a steered beam of ultrasound ~~[[beam]]~~ into said tissue;

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receiving echoes of said ultrasound beam with said transducer array and an  
ultrasound receiver; and

generating an image of said tissue from one or both of said thermoacoustically  
generated signals and said echoes of said ultrasound beam.

17. (Currently amended) The method of claim 16, wherein an image of the tissue is created from  
said echoes and an image of the tissue is created from said representation generated from said  
thermoacoustically generated signals, and said images are presented on display overlaid in spacial  
registration or in comparison with each other.

18. (previously presented) The method of claim 16, wherein said thermoacoustically  
generated signals are delivered to a TACT processing system for producing TACT images using  
acoustic signals detected by the said detector array.

19. (previously presented) The method of claim 16, wherein said ultrasound echoes are sent  
to an ultrasound imaging system.

20. (previously presented) The method of claim 16, wherein said ultrasound beam is  
generated using steering delays controlled by an ultrasound imaging system.

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21. (previously presented) The method of claim 18, wherein said TACT processing system sends images to a display.

22. (previously presented) The method of claim 19, where in said ultrasound imaging system sends images to a display.